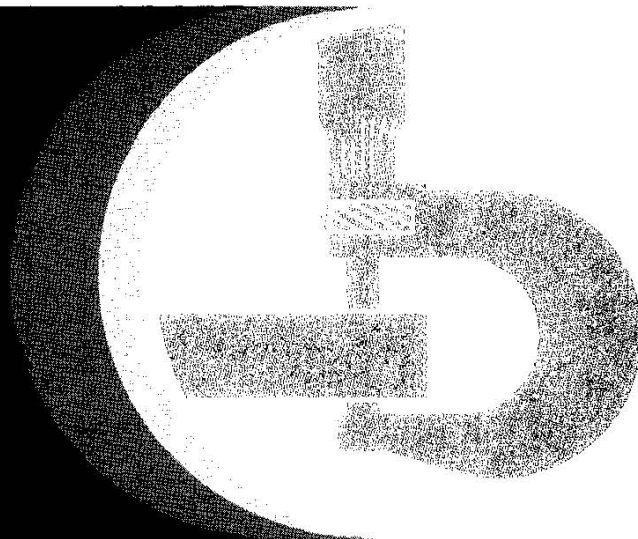


2140 Tractor



John Deere Werke Mannheim
John Deere Ibérica S.A. Getafe
TM-4373

Printed in Germany (English)

2140 Tractor

Technical Manual

TM-4373

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Group 00

Specifications and Special Tools

Specifications

Serial Numbers

The engine serial number is stamped into the plate located on the lower front right-hand side of the cylinder block.

NOTE: When ordering engine parts, quote all digits of serial number stamped on the plate.

The plate showing the tractor serial number is located on the right-hand side of the front axle carrier.

NOTE: When ordering tractor spare parts (excluding engine parts), quote all digits and letters of serial number stamped on the plate.

A plate showing the tractor type, transmission serial number, cone point measurement etched into pinion face of differential drive shaft as well as reduction of differential is located on the right-hand side of the transmission case.

Model Numbers

The fuel injection pump, fuel injection nozzles, alternator, starting motor, hydrostatic steering valve, compressor of air conditioning system (when equipped) and hydraulic pump have model numbers to facilitate identification of different makes of a given unit.

Engine

Number of cylinders		4
Cylinder liner bore	106.5 mm	4.19 in.
Stroke	110 mm	4.33 in.
Displacement	3920 cm ³	239 cu.in.
Compression ratio		16.8 : 1
Maximum torque at 1600 rpm	270 Nm	199 ft-lb
Firing order		1 - 3 - 4 - 2
Valve clearance (engine hot or cold)		
Intake valve .....	.035 mm	0.014 in.
Exhaust valve .....	.045 mm	0.018 in.

Fast idle speed	2610 to 2660 rpm	
Slow idle speed	700 to 800 rpm	
Rated engine speed	2500 rpm	
Working speed range	1600 to 2500 rpm	
Flywheel horsepower at engine rated speed — 2500 rpm		
According to DIN 70020. . . . .	.60 kW	82 hp
PTO* horsepower at engine rated speed — 2500 rpm		
According to DIN 70020. . . . .	.54 kW	74 hp
According to SAE J816b. . . . .	.54 kW	72 hp
Lubrication system	Full internal force feed system with full flow filter	

Engine Clutch Single dry disk clutch with torsion damper, foot-operated

Cooling System

Type	Pressurized system with centrifugal pump
Temperature regulation	Thermostat

Fuel System

Type	Direct injection
Fuel injection pump timing to engine	TDC
Fuel injection pump type	Distributor type
up to engine serial no. 526 865 CD	Roto Diesel No. R 3443 F 680
from engine serial no. 526 866 CD	Roto Diesel No. R 3443 F 910
Air cleaner.	Dry-type air cleaner with secondary (safety) element

* With the engine run in (above 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation $\pm 5\%$.

Electrical System

- Batteries 2 x 12 volts, 55 Ah
 - Tractors with SG2 cab 2 x 12 volts, 55 Ah or 66 Ah
- Alternator with internal regulator
 - Tractors without operator's cab 14 volts, 33 or 55 amps.
 - Tractors with operator's cab 14 volts, 55 amps.
- Starting motor 12 volts, 3 kW (4 hp)
- Battery terminal grounded negative

Synchronized Transmission

- Type Synchronized transmission
- Gear selections 8 forward and 4 reverse
- Gear shifting Two forward groups and one reverse group
Synchronized forward and reverse shifting
within groups

Collar Shift Transmission

- Type Helical gears
- Gear selections 8 forward, 4 reverse speeds
- Gear shifting Two forward ranges, One reverse range

Hi-Lo Shift Unit

- Type Hydraulic gear reduction unit which can be shifted under load with "wet" multiple disk clutch and brake packs
- Travel speed decreases in each gear by Approx. 20 %
- Shifting to reduced (Lo) speed Preloaded cup springs
- Shifting to normal (Hi) speed Hydraulic

Creeper Transmission

- Type Synchronized reduction unit
- Travel speed decreases in low (l) and reverse ranges by approx. 79 %
- Shifting both ranges Mechanical and not under load

Differential and Final Drives

Type of differential..... Spiral bevel gears
 Type of final drive..... Planetary reduction drive

Differential Lock

Operation..... Hand or foot operated
 Disengage..... Will disengage automatically as soon as traction has equalized

PTO

Type..... Independent of transmission, can be engaged and disengaged under load

PTO speeds with engine speed of:

2400 rpm* or 2040 rpm**..... 540 rpm
 2400 rpm..... 1000 rpm
 (changing PTO stub shaft or handshift change)

PTO clutch..... Hydraulically operated "wet" disk clutch

PTO brake..... Hydraulically operated "wet" disk brake

PTO SPEEDS (in rpm)

Engine speed	540 rpm shaft	1000 rpm shaft
800	180* or 210**	335
2400* or 2040**	540	1000
2500	565* or 660**	1040
2660	600* or 705**	1110

Mechanical Front Wheel Drive

Type..... Engaged hydraulically, under full load with "wet" disk clutch

Control..... Electrical/hydraulic solenoid switch

Engagement..... Preloaded cup springs

Disengagement..... Hydraulic

* up to tractor serial no. 507 867 L
 ** From tractor serial no. 507 868 L

Hydrostatic SteeringWithout mechanical linkage between steering valve and the front wheels

Power SteeringHydraulically operated steering linkage

Manual SteeringRecirculating ball bearing type

Foot BrakesSelf-adjusting, hydraulically operated "wet" disk brakes

HandbrakeMechanically operated band-type locking brake acting on the differential

Hydraulic System

TypeClosed center, constant pressure system

Standby pressure*19000 kPa 190 bar 2760 psi

Operating pressure**17000 kPa 170 bar 2470 psi

Hydraulic pump4 or 8-piston pump with variable displacement

Capacities

Fuel tank

Plastic tank 102 liters 26.9 U.S.gals.

Metal tank 90 liters 23.8 U.S.gals.

Cooling system

Without operator's cab 13 liters 3.4 U.S.gals.

With operator's cab 15 liters 4 U.S.gals.

Engine crankcase

Without filter change 8 liters 2.1 U.S.gals.

With filter change8.5 liters 2.25 U.S.gals.

Transmission - Hydraulic system (including oil reservoir and oil cooler)

Synchronized transmission

Initial filling 64 liters 16.9 U.S.gals.

Oil change 56 liters 14.8 U.S.gals.

Collar shift transmission

Initial filling 52 liters 13.75 U.S.gals.

Oil change 44 liters 11.6 U.S.gals.

Oil reservoir 4 liters 1.1 U.S.gals.

Oil cooler 2 liters 0.5 U.S.gals.

On tractors for Canada only:

* 15500 kPa 155 bar 2250 psi

** 14000 kPa 140 bar 2050 psi

Capacities (Contd.)

Mechanical front wheel drive

Front axle housing		
up to serial no. 449 999 L	6.5 liters	1.7 U.S.gals.
from serial no. 450 000 L	7.0 liters	1.85 U.S.gals.
Wheel hub housing, each		
up to serial no. 449 999 L	1.0 liter	0.3 U.S.gals.
from serial no. 450 000 L	0.75 liter	0.2 U.S.gals.
Belt pulley	1.0 liter	0.3 U.S.gals.

Travel Speeds see Operator's Manual

Front and Rear Wheels

Tires, tread widths, tire pressures and ballast weights see Operator's Manual

Dimensions and Weights see Operator's Manual

Predelivery, Delivery and After-Sales Inspections

ENGINE SPEEDS

Slow idle	700 to 800 rpm
Fast idle	2610 to 2660 rpm
Rated speed.....	2500 rpm

FAN BELT

The fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

COMPRESSOR BELT

The compressor belt should have 19 mm (3/4 in.) flex with 60 N (13 lb) pull midway between pulleys.

BATTERIES

Specific gravity at an electrolyte temperature of 20°C (68°F)

Normal and arctic conditions	1.28
Tropical conditions	1.23

CLUTCH OPERATING ASSY.

Tractors without Cab or with OPU

Clutch pedal free travel	approx. 25 mm 1 in.
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Tractors with SG2 Cab

Slave cylinder operating rod, stroke	8.5 to 12.0 mm 5/16 to 15/32 in.
--	-------------------------------------

FRONT WHEEL TOE-IN

Tractors without front wheel drive	3 to 6 mm	0.12 to 0.25 in.
Tractors with MFWD.....	0 to 3 mm	0 to 0.12 in.

TORQUES FOR HARDWARE

Front wheel rim to hub		
Tractors without front wheel drive.....	180 Nm	130 ft-lb
Tractors with MFWD	300 Nm	220 ft-lb
Axle knees to axle center, cap screws	400 Nm	300 ft-lb

Tractors with Hydrostatic Steering

Tie rod clamps		
Cap screw M 10	55 Nm	40 ft-lb
Cap screw M 12	90 Nm	65 ft-lb
Tie rod tube, cap screw	55 Nm	40 ft-lb

Tractors with Power Steering or Manual Steering

Outer clamp of tied rod, cap screw	90 Nm	65 ft-lb
Inner clamp of tie rod, cap screw	55 Nm	40 ft-lb

TORQUES FOR HARDWARE (Contd.)

Rear wheels		
Rear wheels to axle	400 Nm	300 ft-lb
Wheel disk to hub (rack-and-pinion axle)	400 Nm	300 ft-lb
4-post roll guard		
Roll guard to fender, cap screws	120 Nm	85 ft-lb
U-bolt hex. nuts	130 Nm	95 ft-lb
2-post roll guard		
To final drive housings, cap screws	230 Nm	170 ft-lb
Both supports to crossbar, cap screws	230 Nm	170 ft-lb
Rear wheel fenders to final drive housings, hex. nuts	130 Nm	95 ft-lb
SG2 cab rubber mounting blocks, hex. nuts	200 Nm	145 ft-lb

Lubrication and Service

CAPACITIES

Engine crankcase		
without filter change	8 liters	2.1 U.S.gals.
with filter change	8.5 liters	2.25 U.S.gals.
Hydraulic clutch operating system		
	300 cm ³	10.5 fl.oz.

Cooling System

without operator's cab	13 liters	3.4 U.S.gals.
with operator's cab	15 liters	4.0 U.S.gals.

Transmission - Hydraulic system (including oil reservoir and oil cooler)

Synchronized transmission

Initial filling	64 liters	16.8 U.S.gals.
Oil change	56 liters	14.8 U.S.gals.

Collar shift transmission

Initial filling	52 liters	13.75 U.S.gals.
Oil change	44 liters	11.6 U.S.gals.

Mechanical front wheel drive

Front axle housing		
up to serial no. 449 999 L	6.5 liters	1.7 U.S.gals.
from serial no. 450 000 L	7.0 liters	1.85 U.S.gals.

Wheel hub housing, each		
up to serial no. 449 999 L	1.0 liter	0.3 U.S.gals.
from serial no. 450 000 L	0.75 liter	0.2 U.S.gals.

Belt pulley	1 liter	0.3 U.S.gals.
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SERVICE INTERVALS

Checking crankcase oil level	every 10 hours
Changing engine oil	every 200 hours
Changing engine oil filter	every 200 hours
Checking fuel filter	every 10 hours
Changing fuel filter	every 1000 hours
Checking transmission/hydraulic system oil level	every 50 hours
Changing transmission/hydraulic system oil filter	every 500 hours
Changing transmission/hydraulic oil	every 1000 hours
Changing hydrostatic steering filter	every 1000 hours
Cleaning hydraulic pump strainer	every 1000 hours
Checking MFWD oil level	every 100 hours
MFWD oil change	every 1000 hours
Cleaning and packing front wheel bearings	every 1000 hours
Lubricating grease fittings	
Mechanical front wheel drive universal-jointed shaft	every 50 hours
in wet and muddy conditions	every 10 hours
Front axle and front axle bearings	every 50 hours
in wet and muddy conditions	every 10 hours
Clutch throw-out bearing grease fitting (when equipped)	every 100 hours
Rear axle bearings	every 500 hours
in wet and muddy conditions	every 10 hours
Three-point hitch	every 200 hours
Front hitch	every 200 hours
Front PTO drive shaft	every 200 hours

Tune-Up

PTO horsepower* at 2500 rpm rated engine speed

According to DIN 70020 . . . . .	.54 kW	74 hp
According to SAE J 816b . . . . .	.54 kW	72 hp

Slow idle 700 to 800 rpm

Fast idle 2610 to 2660 rpm

Rated engine speed 2500 rpm

Air intake system vacuum3.5 to 6.0 kPa	35 to 60 mbar	14 to 25 in. water head
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Air cleaner restriction warning switch closes at a vacuum of5.5 to 6.5 kPa	55 to 65 mbar	22 to 26 in. water head
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Radiator cap high pressure valve opens at40 to 50 kPa	0.4 to 0.5 bar	6 to 7 psi
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Radiator cap low pressure valve opens at0 to 4 kPa	0 to 0.04 bar	0 to 0.6 psi
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FAN BELT

Fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

COMPRESSOR BELT

Compressor belt should have 19 mm (3/4 in.) flex with 60 N (13 lb) pull midway between pulleys.

* With the engine run in (more than 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation $\pm 5\%$.

Tractor Separation

TORQUES FOR HARDWARE (TRACTORS WITHOUT INCREASED LIFTING CAPACITY)

Front axle carrier to engine block		
front attaching cap screws (4 used)	230 Nm	170 ft-lb
rear attaching cap screws (2 used)	180 Nm	130 ft-lb
Front axle carrier to oil pan, cap screws	400 Nm	300 ft-lb
Hydraulic pump drive shaft, cap screws	50 Nm	35 ft-lb
Jointed shaft flange to front axle		
drive hub (tractors with MFWD), cap screws	75 Nm	55 ft-lb
Drag link* to bell crank or steering arm,		
slotted nut**	75 Nm	55 ft-lb
Clutch housing to engine block		
cap screws	230 Nm	170 ft-lb
hex. nuts	230 Nm	170 ft-lb
Oil pan to clutch housing, cap screws	230 Nm	170 ft-lb
Clutch housing to transmission, cap screws	160 Nm	120 ft-lb
Transmission case drain plugs	135 Nm	100 ft-lb
Retainer of hydraulic lines to clutch housing,		
cap screw	45 Nm	32 ft-lb
Final drive housings to transmission case,		
cap screws	120 Nm	85 ft-lb
Rockshaft housing to transmission case, cap screws	120 Nm	85 ft-lb
Rear wheels to rear axle	400 Nm	300 ft-lb
Wheel disk to hub (on tractors equipped		
with rack-and-pinion axle)	400 Nm	300 ft-lb
4-post roll guard		
Roll guard to fender, cap screws	120 Nm	85 ft-lb
U-bolt hex. nuts	130 Nm	95 ft-lb
2-post roll guard		
To final drive housings, cap screws	230 Nm	170 ft-lb
Both supports to crossbar, cap screws	230 Nm	170 ft-lb

* On tractors with power or manual steering

** *NOTE: If cotter pin cannot be inserted when tightening to the specified torque, turn nut to next slot and secure with cotter pin.*

10-00-14 Specifications and Special Tools

General

Basic weight to front axle carrier, cap screws	400 Nm	300 ft-lb
Drawbar to transmission case, cap screws	120 Nm	85 ft-lb

OPI Cab





Cab to rubber bearing block, slotted nuts*	10 to 20 Nm	7 to 14 ft-lb
Rubber bearing block to bearing and pivot brackets, cap screws	50 Nm	35 ft-lb
Bearing pivot bracket to final drive housing, cap screws	100 Nm	70 ft-lb
Bearing bracket to battery box, cap screws	50 Nm	35 ft-lb
Battery box to flywheel housing, upper cap screw	200 Nm	145 ft-lb
lower cap screws	100 Nm	70 ft-lb

SG2 Cab

Cab to rubber bearing blocks, cap screws and hex. nuts	200 Nm	145 ft-lb
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* NOTE: Insert cotter pin within specified torque.

Standard Torques

Recommended torques in Nm, mkp and ft-lb for UNC and UNF cap screws						
Head marking (Identifying strength)	  or 10.9*			  or 12.9**		
	Thread-O.D. (In.)	Nm	mkp	ft-lb	Nm	mkp	ft-lb
1/4	15	1.5	10	20	2	15
5/16	30	3	20	40	4	30
3/8	50	5	35	70	7	50
7/16	80	8	55	110	11	80
1/2	120	12	85	170	17	120
9/16	180	18	130	240	24	175
5/8	230	23	170	320	32	240
3/4	400	40	300	580	58	425
7/8	600	60	445	930	93	685
1	910	91	670	1400	140	1030
1-1/8	1240	124	910	1980	198	1460
1-1/4	1700	170	1250	2800	280	2060

NOTE: A variation of $\pm 10\%$ is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

- * Tempered steel high strength bolts and cap screws
- ** Tempered steel extra high strength bolts and cap screws

Recommended torques in Nm, mkp and ft-lb for metric cap screws									
Head marking (identifying strength)	8.8*			10.9**			12.9***		
	Nm	mkp	ft-lb	Nm	mkp	ft-lb	Nm	mkp	ft-lb
M5	7	0.7	5	9	0.9	6.5	10	1	8.5
M6	10	1	8.5	15	1	10	20	2	15
M8	30	3	20	40	4	30	40	4	30
M10	50	5	35	80	8	60	90	9	70
M12	100	10	75	140	14	100	160	16	120
M14	160	16	120	210	21	155	260	26	190
M16	240	24	175	350	35	260	400	40	300
M20	480	48	355	650	65	480	780	78	575
M24	820	82	605	1150	115	850	1350	135	995
M30	1640	164	1210	2250	225	1660	2700	270	1990
M36	2850	285	2110	4000	400	2950	4700	470	3465

NOTE: A variation of $\pm 10\%$ is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased- or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

- * Regular bolts and cap screws
- ** Tempered steel high strength bolts and cap screws
- *** Tempered steel extra high strength bolts and cap screws

Recommended torques in Nm, mkp and ft-lb for pipe and hose connections						
Thread size	with O-rings			with cone		
	Nm	mkp	ft-lb	Nm	mkp	ft-lb
3/8-24 UNF	7.5	0.75	5.5	8	0.8	6
7/16-20 UNF	10	1	7	12	1.2	9
1/2-20 UNF	12	1.2	9	15	1.5	11
9/16-18 UNF	15	1.5	11	25	2.5	18
3/4-16 UNF	25	2.5	20	45	4.5	35
7/8-14 UNF	40	4	30	60	6	45
1-1/16-12 UNC	60	6	45	100	10	75
1-3/16-12 UNC	70	7	50	120	12	90
1-5/16-12 UNC	80	8	60	140	14	105
1-5/8-12 UNC	110	11	80	190	19	140
1-7/8-12 UNC	150	15	110	220	22	160

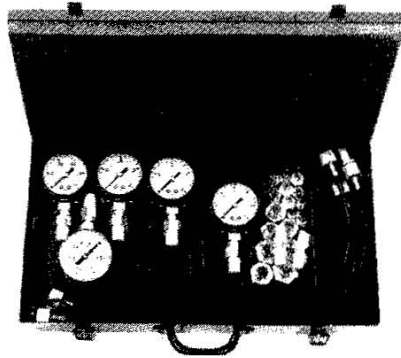
Special Tools

Tune-Up

Tools

Description and Part No.

Use

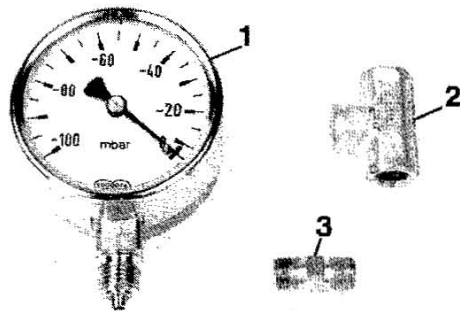


L30515A

Fig. 1 – Pressure Gauge Set

FKM 10002

Measuring air intake system vacuum



L106472

Fig. 2 – Vacuum Gauge and Connectors

Vacuum gauge and connector
FKM 10310

Measuring air intake system vacuum

Consisting of:

- 1 Vacuum gauge
FKM 10242
- 2 T-piece
FKM 10308
- 3 Connector
FKM 10309